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(54) 【発明の名称】 磁性トナー

(57) 【要約】 (修正有)

【構成】 下記の一般式 (I) で示される、Cd/Mn/Teの三元混合半導体からなる透明磁性材料を含有する磁性カラートナー。

【効果】 透明性に優れたカラートナーが得られ、色の濁りがなく、減色法により鮮明なフルカラー印刷・複写が可能となり、OHPシートの印刷に用いた場合にも“くすみ”の無い画像が得られる。

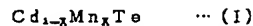
$Cd_x - x Mn_x Te \quad \cdots (I)$

(但し、 $0.01 \leq x \leq 0.75$)

【特許請求の範囲】

【請求項1】 下記化1の一般式(1)

【化1】

(但し、 $0.01 \leq x \leq 0.75$)

で表わされる半磁性半導体からなる透明磁性材料を含有することを特徴とする磁性トナー。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、複写機、レーザービームプリンター等の各種プリンターなど、電子写真法、静電記録法等において形成される静電潜像を現像するために用いられる磁性トナーに関する。

【0002】

【従来の技術】電子写真法においては、感光体を均一帯電したのち画像露光して、低電位部と高電位部とからなる静電潜像を形成し、これをトナーと呼ばれる粉体現像剤により現像としてトナー像を形成して可視化し、このトナー像を紙などに転写したのち、ヒートロール方式などにより定着して複写物ないしは印刷物を得ている。トナーには、磁性材料を含有する磁性トナーと、含有しない非磁性トナーがあり、本発明はこのうちの磁性トナーに関する。

【0003】磁性トナーは次のような利点を有している。

(1) 磁性トナー自体で磁気ブラシを形成しうるので、キャリアを用いることなく、トナーのみからなる1成分現像剤として磁気ブラシ現像法に用いることができる。また、一般的なキャリアを用いた2成分現像剤においても、カブリ防止やトナー飛散防止に用いることができる。

【0004】(2) 導電性磁性キャリアとトナーとを組み合わせる2成分現像剤とする場合、静電気力によりトナーをキャリアに確実に引き付けることが難しい場合がある。このような場合にも、トナーに適度の磁性を付与することにより、磁力によりトナーをキャリアに引き付けることができる。導電性磁性キャリアと磁性トナーとからなる2成分現像剤を用いる現像方式としては、例えば、特開平5-80591号公報に記載された背面記録方式による画像形成方法がある。

【0005】(3) 現像ゾーンで静電潜像が形成された感光体と接触したトナーのうち、非画像部のトナーは、感光体が現像剤溜りと離れる時に、感光体を離れて確実に現像剤溜りに回収される必要がある。一般にこれは現像バイアス電圧の大きさを調整することにより行っているが、磁性キャリアと適度な磁力の磁性トナーとを組み合わせ、磁力によりトナーを現像剤溜りに回収すれば、現像バイアス電圧の設定・制御の自由度が増す。

【0006】磁性トナーに磁力を付与する代表的な磁性

材料は、マグネタイトとフェライトである。しかしこれらは、ともに黒色顔料であり、カラー化は不可能である。また、マグヘマイトも知られているが、これは茶色である。したがって、一般に、茶色以外の磁性カラートナーは不可能であると考えられている。

【0007】一方、従来から透明磁性体としてYIG系の希土類系の化合物が提案されており、透明磁性体として希土類ガーネットを含む磁性カラートナー（特開昭60-73549号公報）、希土類ガーネット、強磁性フェライト等の透明磁性体を含む磁性マイクロカプセルカラートナー（特開昭60-73548号公報）、希土類ガーネット、強磁性フェライト等の透明磁性体を含むノンインパクトプリンティング方式用磁性インク（特開平1-283187号公報）、イットリウム・ガリウム・ガーネットの単結晶または多結晶を透明磁性粉として用いた磁気プリンタ用磁性カラートナー（特開昭63-50856号公報）などが報告されている。

【0008】しかしながら、磁力を付与する目的でYIG系粉末を20～50%トナー中に添加すると、茶色の濁りが見られる。そのため、減色法により鮮明なフルカラー印刷が得られず、特に、OHPフィルムに現像、定着した場合には、くすんだ色調になってしまう。これは、YIGが可視光領域でわずかに着色しているために、色にくすみが生じるためである。

【0009】

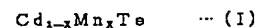
【発明が解決しようとする課題】本発明は、透光性に優れ、OHPフィルム上でも色の濁りを生じることなく、減色法により鮮明なフルカラー印刷が可能な磁性トナーを提供するものである。

【0010】

【課題を解決するための手段】本発明の磁性トナーは、下記化2の一般式(1)

【0011】

【化2】

(但し、 $0.01 \leq x \leq 0.75$)

で表わされる半磁性半導体からなる透明磁性材料を含有することを特徴とし、特に、磁性カラートナーとしての利用に好適である。

【0012】

【発明の実施態様】本発明では、透明磁性材料として、上記一般式(1)の半磁性半導体（以下、 $\text{Cd}(1-x)\text{Mn}(x)\text{Te}$ と呼ぶこともある）。 $\text{Cd}(1-x)\text{Mn}(x)\text{Te}$ は、通常の化合物半導体の陽イオンをMn（マンガン）で置換した三元混晶半導体であり、半導体と磁性体の両面の性質を示す。 $\text{Cd}(1-x)\text{Mn}(x)\text{Te}$ は、II-VI族化合物半導体のII族元素をMnで一部置換したもので、可視光領域で優れた磁気光学特性を有することから、光アイソレータとして注目され

ている (Allen E. Turner, Robert L. Gunshor and Supriyo Datta, APPLIED OPTICS, Vol. 22, No. 15, October 1983)

【0013】Cd (1-x) Mn (x) Te の組成で x が増加すると、光学的なバンドギャップが 1.5 eV (x=0) から 2.4 eV (x=0.73) まで広がることに伴って、高エネルギー側にシフトする。光アイソレータの光学特性を示すファラデー回転分散特性の分散ピークの値も組成の増加に伴って大きくなっていく。

【0014】磁性トナーの磁性材料として使用する本発明においては、可視光領域での透明性が高く、かつ磁力の大きいことが望ましい。具体的には、Cd (1-x) Mn (x) Te で、x が 0.01~0.75 の範囲が好ましく、より好ましくは 0.1~0.6 である。Cd (1-x) Mn (x) Te は、本発明のトナー中に 5~70 重量%配合することが好ましく、より好ましくは 20~50 重量%である。Cd (1-x) Mn (x) Te は、平均粒径 0.1~1 μm 程度の微粒子として配合することが望ましい。

【0015】なお、Cd (1-x) Mn (x) Te は、クラスターイオンビーム法 (ICB 法)、多結晶法、単結晶法等のいずれの方法によっても製造することができる。本発明の磁性トナーにおいては、他の成分として通常のトナー用成分を配合することができ、例えば、着色剤、バインダー樹脂、電荷制御剤、離型剤、外添剤などを配合することができる。

【0016】着色剤としては、従来公知ものが使用でき、ベンジジン系黄色顔料、フロンイエロー、アセト酢酸アニリド系アゾ顔料、モノアゾ染料、アゾメチン系色素などのイエロートナー用着色剤；キナクリドンレッド、ナフトール系アゾ顔料、アントラキノン系染料、キサンテン系染料等のマゼンタトナー用着色剤；銅フタロシアニン系顔料等のシアントナー用着色剤などが用いられる。

【0017】バインダー樹脂としては、ポリエステル系樹脂、スチレン樹脂、スチレン-アクリル共重合体等のスチレン系樹脂が代表的であり、さらに、ポリビニルブチラール、エポキシ樹脂、ポリアミド、ポリメチルメタクリレート等の他の樹脂、あるいはこれらのブレンド品を用いることもできる。本発明のトナーは、例えば、常法に従い各成分を混練したのち粉砕、分級し必要によりシリカ等の外添剤を添加することにより得ることができる。

【0018】

【発明の効果】本発明によれば、Cd (1-x) Mn (x) Te を透明磁性材料として配合してトナーとすることにより、透明性に優れた磁性トナーが得られる。よって、カラートナーとした場合にも色の濁りがなく、減色法により鮮明なフルカラー印刷・複写が可能となり、OHP シートの印刷に用いた場合にも”くすみ”の無い画像が得られる。

【0019】

【実施例】

実施例 1

単結晶法により、本発明の透明磁性体を作成し、これを微粉砕して以下の表 1 の組成で十分に均一混練した。

【0020】

【表 1】

表 1：混練物の組成

ポリエステル系樹脂	60 重量%
ポリエチレンワックス	3 重量%
Cd (0.55) Mn (0.45) Te 粉末	30 重量%
透明電荷制御剤	1 重量%
キナクリドンレッド	6 重量%

上記の混練物を粉砕、分級して平均粒径 10 μm とし、さらに外添剤としてシリカを 0.3% 添加して、流動性に優れた本発明のマゼンタトナーを得た。このトナーを導電性磁性キャリアに対して 10 重量%の割合で混合して 2 成分現像剤とし、「従来の技術」の欄で説明した特開平 5-80591 号公報に記載の背面記録方式のプリンターで OHP シートに対して画像形成を行ったところ、色濁りのない鮮明な画像が得られた。

【0021】また、上記組成において、Cd (0.5) Mn (0.45) Te 粉末の量を 20%、25%、35%、40%、45%、50% と変化させてトナーを作成したところ (増減分は、ポリエステル系樹脂で調整)、いずれも十分な透光性、磁性を有することが確認された。

【0022】実施例 2

キナクリドンレッドに替えてジスアゾイエローを用いる他は、実施例 1 と同様の操作を繰り返し、本発明の磁性イエロートナーを得た。このトナーを用いて実施例 1 と同様に OHP シート上に画像形成を行ったところ、色濁りの無い鮮明な画像が形成された。

【0023】実施例 3

キナクリドンレッドに替えてフタロシアニンブルーを用いる他は、実施例 1 と同様の操作を繰り返し、本発明の磁性シアントナーを得た。このトナーを用いて実施例 1 と同様に OHP シート上に画像形成を行ったところ、色濁りの無い鮮明な画像が形成された。

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CLAIMS

[Claim(s)]

[Claim 1] The general formula of the following-izing 1 (I)

[Formula 1]

$\text{Cd}_{1-x}\text{Mn}_x\text{Te} \quad \dots (I)$

(但し、 $0.01 \leq x \leq 0.75$)

The magnetic toner characterized by containing the transparence magnetic material which comes out and consists of a half-magnetic semiconductor expressed.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to magnetic toners used in order to develop the electrostatic latent image formed in a xerography, an electrostatic recording method, etc., such as various printers, such as a copying machine and a laser beam printer.

[0002]

[Description of the Prior Art]-In the xerography, after forming the electrostatic latent image which carried out homogeneity electrification of the photo conductor and which carries out after image exposure and consists of the low voltage section and the high potential section, forming a toner image as development with the fine-particles developer called a toner in this, visualizing and imprinting this toner image on paper etc., it was established with the heat roll method etc. and a duplication or printed matter has been obtained. There are a magnetic toner containing a magnetic material and a nonmagnetic toner which is not contained as toner, and this invention relates to the magnetic toner of these.

[0003] The magnetic toner has the following advantages.

(1) It can use for the magnetic brush developing-negatives method as a 1 component developer which consists only of a toner, without using a carrier, since a magnetic brush can be formed with the magnetic toner itself. Moreover, it can use for fogging prevention or toner scattering prevention also in 2 component developer using a common carrier.

[0004] (2) When considering as 2 component developer combining a conductive magnetism carrier and a toner, it may be difficult to draw a toner certainly on a carrier according to electrostatic force. Also in this case, magnetism can draw a toner on a carrier by giving moderate magnetism to a toner. As a development method using 2 component developer which consists of a conductive magnetism carrier and a magnetic toner, there is the image formation approach by the tooth-back recording method indicated by JP,5-80591,A, for example.

[0005] (3) Among the toners in contact with the photo conductor with which the electrostatic latent image was formed in the development zone, when a photo conductor separates with developer ***, the toner of the non-image section leaves a photo conductor, and need to be certainly collected by developer **. Generally, although carried out by adjusting the magnitude of development bias voltage, if magnetism recovers a toner to developer ** combining a magnetic carrier and the magnetic toner of moderate magnetism, the degree of freedom of this of a setup and control of development bias voltage will increase.

[0006] The typical magnetic materials which give magnetism to a magnetic toner are magnetite and a ferrite. However, these [both] are black pigments and colorization is impossible. Moreover, this is brown although maghemite is also known. Therefore, generally it is thought that magnetic color toners other than brown are impossible.

[0007] On the other hand, the compound of the rare earth system of a YIG system is proposed as the transparence magnetic substance from the former. The magnetic color toner which contains a rare earth garnet as the transparence magnetic substance (JP,60-73549,A), The magnetic microcapsule color toner containing the transparence magnetic substance, such as a rare earth garnet and a ferromagnetic ferrite, (JP,60-73548,A), The magnetic ink for non impact

printing methods containing the transparence magnetic substance, such as a rare earth garnet and a ferromagnetic ferrite, (JP,1-283187,A), The magnetic color toner for magnetic printers (JP,63-50856,A) using the single crystal or polycrystal of an yttrium gallium garnet as transparence magnetism powder etc. is reported.

[0008] However, muddiness of brown will be seen, if YIG system powder is added in 20 - 50% toner in order to give magnetism. Therefore, when clear full color printing is not obtained by the subtractive color process but it is especially developed negatives and fixed to an OHP film, it will become the somber color tone. Since YIG is coloring slightly in the light field, this is for dullness to arise in a color.

[0009]

[Problem(s) to be Solved by the Invention] This invention offers the magnetic toner in which clear full color printing is possible with a subtractive color process, without excelling in translucency and producing muddiness of a color also on an OHP film.

[0010]

[Means for Solving the Problem] The magnetic toner of this invention is the general formula (I) of the following-izing 2.

[0011]

[Formula 2]

$Cd_{1-x}Mn_xTe$... (I)

(但し、 $0.01 \leq x \leq 0.75$)

It is characterized by containing the transparence magnetic material which comes out and consists of a half-magnetic semiconductor expressed, and is suitable for the use as a magnetic color toner especially.

[0012]

[Embodiment of the Invention] At this invention, it is the half-magnetic semiconductor (hereafter referred to as $Cd(1-x)Mn(x)Te$) of the above-mentioned general formula (I) as a transparence magnetic material. $Cd(1-x)Mn(x)Te$ is the 3 yuan mixed-crystal semiconductor which permuted the cation of the usual compound semiconductor from Mn (manganese), and shows the property of both sides of a semi-conductor and the magnetic substance. Since $Cd(1-x)Mn(x)Te$ has the magneto-optics property which is what permuted II group element of an II-VI group compound semiconductor in part from Mn, and was excellent in the light field, it attracts attention as an optical isolator (Allen E.Turner, Robert L.Gunshor and Supriyo Datta, APPLIED OPTICS. Vol.22, No.15, October 1983).

[0013] If x increases by the presentation of $Cd(1-x)Mn(x)Te$, it will shift to a high energy side corresponding to an optical band gap spreading from 1.5eV ($x=0$) to 2.4eV ($x=0.73$). The value of the distributed peak of the Faraday-rotation distribution property which shows the optical property of an optical isolator also becomes large with the increment in a presentation.

[0014] In this invention used as a magnetic material of a magnetic toner, it is desirable for the transparency in a light field to be high, and for the magnetism of transparency to be large. It is $Cd(1-x)Mn(x)Te$, and the range of x of 0.01-0.75 is desirable, and, specifically, it is 0.1-0.6 more preferably. As for $Cd(1-x)Mn(x)Te$, it is desirable to blend five to 70% of the weight into the toner of this invention, and it is 20 - 50 % of the weight more preferably. As for $Cd(1-x)Mn(x)Te$, it is desirable to blend as a particle with a mean particle diameter of about 0.1-1 micrometer.

[0015] In addition, $Cd(1-x)Mn(x)Te$ can be manufactured by any approaches, such as the ionized cluster beam method (ICB law), a polycrystal method, and a single crystal method. In the magnetic toner of this invention, the usual component for toners can be blended as other components, for example, a coloring agent, binder resin, a charge control agent, a release agent, an external additive, etc. can be blended.

[0016] As a coloring agent, a well-known thing can be used conventionally and coloring agents for cyanogen toners, such as coloring agent; copper-phthalocyanine system pigments for Magenta toners, such as coloring agent; Quinacridone red for yellow toners, such as a benzidine

system yellow pigment, FORON yellow, an acetoacetanilide system azo pigment, a monoazo color, and azomethine system coloring matter, a naphthol system azo pigment, an anthraquinone system color, and a xanthene system color, etc. are used.

[0017] As binder resin, styrene resin, such as polyester system resin, styrene resin, and a styrene-acrylic copolymer, is typical, and other resin, such as a polyvinyl butyral, an epoxy resin, a polyamide, and polymethylmethacrylate, or such blend articles can also be used further. The toner of this invention can be obtained by grinding and classifying and adding external additives, such as a silica, as occasion demands, after kneading each component according to a conventional method.

[0018]

[Effect of the Invention] According to this invention, the magnetic toner excellent in transparency is obtained by blending $\text{Cd}(1-x) \text{Mn}(x) \text{Te}$ as a transparency magnetic material, and considering as a toner. therefore, the case where there was no muddiness of a color also when it considered as a color toner, clear full color printing and copy were attained with the subtractive color process, and it uses for printing of an OHP sheet -- " -- the image which is somber and does not have "is obtained.

[0019]

[Example]

By the example 1 single-crystal method, the transparency magnetic substance of this invention was created, this was pulverized, and homogeneity kneading was fully carried out by the presentation of following Table 1.

[0020]

[Table 1]

Table 1: Presentation polyester system resin of kneading object 60-% of the weight polyethylene wax 3-% of the weight $\text{Cd}(0.55) \text{Mn}(0.45) \text{Te}$ powder 30-% of the weight transparency charge control agent 1-% of the weight Quinacridone red The kneading object of 6 % of the weight above was ground and classified, it considered as the mean particle diameter of 10 micrometers, the silica was further added 0.3% as an external additive, and the Magenta toner of this invention excellent in the fluidity was obtained. This toner was mixed at 10% of the weight of a rate to the conductive magnetism carrier, and it considered as 2 component developer, and when the printer of the tooth-back recording method of a publication performed image formation to JP,5-80591,A explained in the column of a "Prior art" to the OHP sheet, the clear image without color muddiness was obtained.

[0021] Moreover, in the above-mentioned presentation, when the amount of $\text{Cd}(0.55) \text{Mn}(0.45) \text{Te}$ powder was changed with 20%, 25%, 35%, 40%, 45%, and 50% and the toner was created (polyester system resin adjusts a fluctuated part), it was checked that all have sufficient translucency and magnetism.

[0022] Changed to example 2 Quinacridone red, and Diarylide Yellow was used, and also the same actuation as an example 1 was repeated, and the magnetic yellow toner of this invention was obtained. When image formation was performed on the OHP sheet like the example 1 using this toner, the clear image without color muddiness was formed.

[0023] Changed to example 3 Quinacridone red, and the copper phthalocyanine blue was used, and also the same actuation as an example 1 was repeated, and the magnetic cyanogen toner of this invention was obtained. When image formation was performed on the OHP sheet like the example 1 using this toner, the clear image without color muddiness was formed.

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TECHNICAL FIELD

[Industrial Application] This invention relates to magnetic toners used in order to develop the electrostatic latent image formed in a xerography, an electrostatic recording method, etc., such as various printers, such as a copying machine and a laser beam printer.

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PRIOR ART

[Description of the Prior Art] In the xerography, after forming the electrostatic latent image which carried out homogeneity electrification of the photo conductor and which carries out after image exposure and consists of the low voltage section and the high potential section, forming a toner image as development with the fine-particles developer called a toner in this, visualizing and imprinting this toner image on paper etc., it was established with the heat roll method etc. and a duplication or printed matter has been obtained. There are a magnetic toner containing a magnetic material and a nonmagnetic toner which is not contained as toner, and this invention relates to the magnetic toner of these.

[0003] The magnetic toner has the following advantages.

(1) It can use for the magnetic brush developing-negatives method as a 1 component developer which consists only of a toner, without using a carrier, since a magnetic brush can be formed with the magnetic toner itself. Moreover, it can use for fogging prevention or toner scattering prevention also in 2 component developer using a common carrier.

[0004] (2) When considering as 2 component developer combining a conductive magnetism carrier and a toner, it may be difficult to draw a toner certainly on a carrier according to electrostatic force. Also in this case, magnetism can draw a toner on a carrier by giving moderate magnetism to a toner. As a development method using 2 component developer which consists of a conductive magnetism carrier and a magnetic toner, there is the image formation approach by the tooth-back recording method indicated by JP,5-80591,A, for example.

[0005] (3) Among the toners in contact with the photo conductor with which the electrostatic latent image was formed in the development zone, when a photo conductor separates with developer ****, the toner of the non-image section leaves a photo conductor, and need to be certainly collected by developer ****. Generally, although carried out by adjusting the magnitude of development bias voltage, if magnetism recovers a toner to developer **** combining a magnetic carrier and the magnetic toner of moderate magnetism, the degree of freedom of this of a setup and control of development bias voltage will increase.

[0006] The typical magnetic materials which give magnetism to a magnetic toner are magnetite and a ferrite. However, these [both] are black pigments and colorization is impossible.

Moreover, this is brown although maghemite is also known. Therefore, generally it is thought that magnetic color toners other than brown are impossible.

[0007] On the other hand, the compound of the rare earth system of a YIG system is proposed as the transparence magnetic substance from the former. The magnetic color toner which contains a rare earth garnet as the transparence magnetic substance (JP,60-73549,A), The magnetic microcapsule color toner containing the transparence magnetic substance, such as a rare earth garnet and a ferromagnetic ferrite, (JP,60-73548,A), The magnetic ink for non impact printing methods containing the transparence magnetic substance, such as a rare earth garnet and a ferromagnetic ferrite, (JP,1-283187,A), The magnetic color toner for magnetic printers (JP,63-50856,A) using the single crystal or polycrystal of an yttrium gallium garnet as transparence magnetism powder etc. is reported.

[0008] However, muddiness of brown will be seen, if YIG system powder is added in 20 - 50% toner in order to give magnetism. Therefore, when clear full color printing is not obtained by the

subtractive color process but it is especially developed negatives and fixed to an OHP film, it will become the somber color tone. Since YIG is coloring slightly in the light field, this is for dullness to arise in a color.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, the magnetic toner excellent in transparency is obtained by blending $\text{Cd}(1-x)\text{Mn}(x)\text{Te}$ as a transparence magnetic material, and considering as a toner. therefore, the case where there was no muddiness of a color also when it considered as a color toner, clear full color printing and copy were attained with the subtractive color process, and it uses for printing of an OHP sheet -- " -- the image which is somber and does not have "is obtained.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] This invention offers the magnetic toner in which clear full color printing is possible with a subtractive color process, without excelling in translucency and producing muddiness of a color also on an OHP film.

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MEANS

[Means for Solving the Problem] The magnetic toner of this invention is the general formula (I) of the following-izing 2.

[0011]

[Formula 2]

$Cd_{1-x}Mn_xTe$... (I)

(但し、 $0.01 \leq x \leq 0.75$)

It is characterized by containing the transparence magnetic material which comes out and consists of a half-magnetic semiconductor expressed, and is suitable for the use as a magnetic color toner especially.

[0012]

[Embodiment of the Invention] At this invention, it is the half-magnetic semiconductor (hereafter referred to as $Cd(1-x)Mn(x)Te$) of the above-mentioned general formula (I) as a transparence magnetic material. $Cd(1-x)Mn(x)Te$ is the 3 yuan mixed-crystal semiconductor which permuted the cation of the usual compound semiconductor from Mn (manganese), and shows the property of both sides of a semi-conductor and the magnetic substance. Since $Cd(1-x)Mn(x)Te$ has the magneto-optics property which is what permuted II group element of an II-VI group compound semiconductor in part from Mn, and was excellent in the light field, it attracts attention as an optical isolator (Allen E.Turner, Robert L.Gunshor and Supriyo Datta, APPLIED OPTICS. Vol.22, No.15, October 1983).

[0013] If x increases by the presentation of $Cd(1-x)Mn(x)Te$, it will shift to a high energy side corresponding to an optical band gap spreading from 1.5eV ($x=0$) to 2.4eV ($x=0.73$). The value of the distributed peak of the Faraday-rotation distribution property which shows the optical property of an optical isolator also becomes large with the increment in a presentation.

[0014] In this invention used as a magnetic material of a magnetic toner, it is desirable for the transparency in a light field to be high, and for the magnetism of transparency to be large. It is $Cd(1-x)Mn(x)Te$, and the range of x of 0.01-0.75 is desirable, and, specifically, it is 0.1-0.6 more preferably. As for $Cd(1-x)Mn(x)Te$, it is desirable to blend five to 70% of the weight into the toner of this invention, and it is 20 - 50 % of the weight more preferably. As for $Cd(1-x)Mn(x)Te$, it is desirable to blend as a particle with a mean particle diameter of about 0.1-1 micrometer.

[0015] In addition, $Cd(1-x)Mn(x)Te$ can be manufactured by any approaches, such as the ionized cluster beam method (ICB law), a polycrystal method, and a single crystal method. In the magnetic toner of this invention, the usual component for toners can be blended as other components, for example, a coloring agent, binder resin, a charge control agent, a release agent, an external additive, etc. can be blended.

[0016] As a coloring agent, a well-known thing can be used conventionally and coloring agents for cyanogen toners, such as coloring agent; copper-phthalocyanine system pigments for Magenta toners, such as coloring agent; Quinacridone red for yellow toners, such as a benzidine system yellow pigment, FORON yellow, an acetoacetanilide system azo pigment, a monoazo

color, and azomethine system coloring matter, a naphthol system azo pigment, an anthraquinone system color, and a xanthene system color, etc. are used.

[0017] As binder resin, styrene resin, such as polyester system resin, styrene resin, and a styrene-acrylic copolymer, is typical, and other resin, such as a polyvinyl butyral, an epoxy resin, a polyamide, and polymethylmethacrylate, or such blend articles can also be used further. The toner of this invention can be obtained by grinding and classifying and adding external additives, such as a silica, as occasion demands, after kneading each component according to a conventional method.

[0018]

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EXAMPLE

[Example]

By the example 1 single-crystal method, the transparence magnetic substance of this invention was created, this was pulverized, and homogeneity kneading was fully carried out by the presentation of following Table 1.

[0020]

[Table 1]

Table 1: Presentation polyester system resin of kneading object 60-% of the weight polyethylene wax 3-% of the weight Cd(0.55) Mn(0.45) Te powder 30-% of the weight transparence charge control agent 1-% of the weight Quinacridone red The kneading object of 6 % of the weight above was ground and classified, it considered as the mean particle diameter of 10 micrometers, the silica was further added 0.3% as an external additive, and the Magenta toner of this invention excellent in the fluidity was obtained. This toner is mixed at 10% of the weight of a rate to a conductive magnetism carrier, and it considers as 2 component developer,

[Translation done.]